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(54) USE OF ANABOLIC AGENTS, ANTI-CATABOLIC AGENTS, ANTIOXIDANT AGENTS, AND ANALGESICS FOR PROTECTION, TREATMENT AND REPAIR OF CONNECTIVE TISSUES IN HUMANS AND ANIMALS

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Related U.S. Application Data

- Continuation of application No. 09/274,881, filed on Mar. 23, 1999, and a continuation-in-part of application No. 09/249,335, filed on Feb. 12, 1999, now Pat. No. 6,451,771.
- (60) Provisional application No. 60/088,205, filed on Jun. 5, 1998, and provisional application No. 60/074,594, filed on Feb. 13, 1998.
- **Int. Cl.**⁷ **A61K 35/78**; A61K 31/70 (51)
- **U.S. Cl.** **424/757**; 514/62; 514/23; (52)514/42
- **Field of Search** 514/62, 23, 42; 424/757

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(57)**ABSTRACT**

The present invention relates to compositions for the protection, treatment and repair of connective tissues in humans and animals comprising any or all of anabolic, anti-catabolic, anti-oxidant and analgesic agents, including aminosugars, S-adenosylmethionine, arachadonic acid, GAGs, including pentosan, collagen type II, tetracyclines or tetracycline-like compounds, diacerin, super oxide dismutase, L-ergothionine, one or more avocado/soybean unsaponifiables, and an analgesic, e.g., acetaminophen, and to methods of treating humans and animals by administration of these novel compositions to humans and animals in need thereof.

4 Claims, 5 Drawing Sheets

ANABOLISM GLUTAMATE GLUTAMINE UTP **GLUCOSE FRUCTOSE** GLUCOSAMINE GLUCOSAMINE UDP. GLUCOSAMINE 1-PHOSPHATE 6-PHOSPHATE 6-PHOSPHATE 6-PHOSPHATE AMINO-TRANSFERASE ADP ACETYL-CoA N-ACETYL-N-ACETYL-**GLYCOSAMINOGLYCANS** ATP GLUCOSAMINE GLUCOSAMINE GLUCOSE 6-PHOSPHATE 1-PHOSPHATE -UTP **EPIMERASE** N-ACÉTYL-HIDP-N-MANNOSAMINE SIALIC ACID **ACETYLGLUCOSAMINE** GANGLIOSIDES. 6-PHOSPHATE **GLYCOPROTEINS** PHOSPHOENOL-NAD+ **EPIMERASE PYRUVATE** GLYCOSAMINOGLYCANS **GLYCOPROTEINS** CMP. **NEURAMINIA ACID** NANA ACETYLGALACTOSAMINE 9-PHOSPHATE

THE SYNTHESIS OF GLYCOSAMINOGLYCANS FROM GLUCOSAMINE